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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/583,375	05/30/2000	Hideho Une	450100-02519	1327

20999 7590 07/27/2004

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NEW YORK, NY 10151

EXAMINER

SOLOMON, GARY L

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/583,375

Applicant(s)

UNE ET AL.

Examiner

Gary L Solomon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 5-14-2004 have been fully considered but they are not persuasive.
2. The applicant has amended the claims to address the rejections as is stated on Page 6 of the Remarks filed on 5-14-2004.

The remarks and newly added limitations are not persuasive and the amended claims still read on the Taura (US 6,642,957) in view of Yamada (US 6,573,935) in further view of Van Rooy (US. 6,657,659) 35 U.S.C. 103 (a) rejection.

Taura teaches a white balance color correction system for a color imaging apparatus compromising:

a solid-state image sensor having photo sensors color-coded with three primary color filters formed like a matrix correspondingly to pixels of the solid-state image sensor, to provide three primary color signals acquired as captured image signals;

(Column 2, Lines 21-35; Figure 3)

a three-channel signal detecting means for detecting, from the three primary color signals provided from the solid-state image sensor,

(Figure 3; Column 5, Lines 15-40)

an R signal acquired from R pixels, a G signal acquired from the G pixel, and a B signal acquired from the B pixels,

(Figure 3; Column 5, Lines 34-40)

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a three-channel variable-gain amplifying means whose channels are controllable in gain independently of one another to amplify the R, G, and B signals; and

(Figure 3, Element 22B, 22G, and 22R)

a gain controlling means for controlling, based on an output from the signal detecting means, the gain of each channel of the variable-gain amplifying means so that the R, G, and B signals amplified by the variable-gain amplifying means are equal in level to one another for an achromatic color image.

(Column 1, Lines 30-33; Figure 3, Element 28)

However, Taura does not teach a four channel detecting means acquiring an R signal from a horizontal line of R, G, R, G, ... color filters, a Gr signal from G pixels the same horizontal line, a Gb signal acquired from G pixels in a horizontal line of G, B, G, B color filters... and a B signal acquired from B pixels in the same horizontal line as claimed. In contrast, Taura teaches the acquisition of R, B, and G signals from their respective filters **(Figure 3)**.

Nevertheless, Yamada teaches the horizontal lines of R, G, R, G, and G, B, G, B in the notoriously well-known Bayer filter pattern **(Figure 1, Column 4, Lines 34-47)**, which would have acquired the signals from these horizontal lines similar to those as claimed in the preceding paragraph. Yamada also teaches the use of separately controlled Gr and Gb signals in order to reduce problems of crosstalk.

(Column 3, Lines 5-10 and 58-62)

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Therefore, taking the combined teaching of Taura and Yamada as whole, it would have been obvious to apply Bayer Filter Pattern as suggested by Yamada to solve the problem of the lateral striped noise or crosstalk.

(Column 3, Lines 5-10 and 58-62)

By taking the combination of Taura and Yamada, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure a four channel signal detecting means, for detecting from the three primary color signals provided in the color image sensor, an R signal acquired from R pixels in a horizontal line of R, G, R, G... and a Gr signal form the same horizontal line, a Gb signal acquired from the G pixels in a horizontal line of G, B, G, B... and a B signal acquired from the B pixels in the same horizontal line.

(The horizontal lines and R, Gr, B, and Gb color signals are taught in thed Yamada reference in Column 4, Lines 34-47.)

Furthermore, it would have also been obvious to control the gains of the R and B channels of the variable gain amplifying means so that the R and B signals amplified by the variable gain amplifying means are equal in level for an achromatic color change by taking the Yamada **(Figure 1, Column 4, Lines 34-47)** and Taura **(Column 1, Lines 30-33; Figure 3, Element 28)** teachings as a whole.

In regards to the newly added limitations filed on 5-14-2004, it would have been further obvious for the gain controlling means controlling gains of Gr and Gb channels of the variable-gain amplifying means so that the amplitude difference between the luminance signal for the horizontal line of R, G, R, G... color filters produced form the R and Gr signal and the

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luminance signal for the horizontal line of G, B, G, B and B color filters produced from the B and Gb signal is substantially reduced.

(If the luminance gains of the R and B channels are equal in level, the difference between the luminance signal from the R, G line and The R, B line will be zero. The difference can't be any less than zero. Therefore, the difference in the signals would be substantially reduced.)

Yamada does teach changing exposure to correct the green colors (**Column 5, Lines 45-50**), but does not teach changing gain to correct the green colors as claimed. Yamada and Taura lack motivation to combine the apparatuses. Yamada teaches only changing correction by controlling exposure.

However, correction can be made by controlling either gain or exposure (Van Rooy; Column 3, Lines 20-25).

Therefore, taking the combined teaching of Taura, Yamada, and Van Rooy as a whole, would have been obvious to one of ordinary skill in the art at the time of the invention to use obvious variation of Yamada as taught by Van Rooy in the apparatus of Taura to effectively eliminate lateral striped noise as suggested by Yamada (**Column 3, Lines 5-10 and 58-62**).

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

4. Claims 1 and 6 objected to because of the following informalities:

Claim 1, Line 19 Gr should say Gb. Appropriate correction is required.

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Claim 6, Line 17 Gr should say Gb. Appropriate correction is required.

5. The claims will be examined under the Gb limitation.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4 & 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taura (US 6,642,957) in view of Yamada (US 6,573,935) in further view of Van Rooy (US 6,657,659),

For claim 1, Taura teaches a white balance color correction system for a color imaging apparatus comprising:

a solid-state image sensor having photo sensors color-coded with three primary color filters formed like a matrix correspondingly to pixels of the solid-state image sensor, to provide three primary color signals acquired as captured image signals;

(Column 2, Lines 21-35; Figure 3)

a three-channel signal detecting means for detecting, from the three primary color signals provided from the solid-state image sensor,

(Figure 3; Column 5, Lines 15-40)

an R signal acquired from R pixels, a G signal acquired from the G pixel, and a B signal acquired from the B pixels,

(Figure 3; Column 5, Lines 34-40)

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a three-channel variable-gain amplifying means whose channels are controllable in gain independently of one another to amplify the R, G, and B signals; and

(Figure 3, Element 22B, 22G, and 22R)

a gain controlling means for controlling, based on an output from the signal detecting means, the gain of each channel of the variable-gain amplifying means so that the R, G, and B signals amplified by the variable-gain amplifying means are equal in level to one another for an achromatic color image.

(Column 1, Lines 30-33; Figure 3, Element 28)

However, Taura does not teach a four channel detecting means acquiring an R signal from a horizontal line of R, G, R, G, ... color filters, a Gr signal from G pixels the same horizontal line, a Gb signal acquired from G pixels in a horizontal line of G, B, G, B color filters... and a B signal acquired from B pixels in the same horizontal line as claimed. In contrast, Taura teaches the acquisition of R, B, and G signals from their respective filters **(Figure 3)**.

Nevertheless, Yamada teaches the horizontal lines of R, G, R, G, and G, B, G, B in the notoriously well-known Bayer filter pattern **(Figure 1, Column 4, Lines 34-47)**, which would have acquired the signals from these horizontal lines similar to those as claimed in the preceding paragraph. Yamada also teaches the use of separately controlled Gr and Gb signals in order to reduce problems of crosstalk.

(Column 3, Lines 5-10 and 58-62)

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Therefore, taking the combined teaching of Taura and Yamada as whole, it would have been obvious to apply Bayer Filter Pattern as suggested by Yamada to solve the problem of the lateral striped noise or crosstalk.

(Column 3, Lines 5-10 and 58-62)

By taking the combination of Taura and Yamada, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure a four channel signal detecting means, for detecting from the three primary color signals provided in the color image sensor, an R signal acquired from R pixels in a horizontal line of R, G, R, G... and a Gr signal from the same horizontal line, a Gb signal acquired from the G pixels in a horizontal line of G, B, G, B... and a B signal acquired from the B pixels in the same horizontal line.

(The horizontal lines and R, Gr, B, and Gb color signals are taught in the Yamada reference in Column 4, Lines 34-47.)

Furthermore, it would have also been obvious to control the gains of the R and B channels of the variable gain amplifying means so that the R and B signals amplified by the variable gain amplifying means are equal in level for an achromatic color change by taking the Yamada (**Figure 1, Column 4, Lines 34-47**) and Taura (**Column 1, Lines 30-33; Figure 3, Element 28**) teachings as a whole.

In regards to the newly added limitations filed on 5-14-2004, it would have been further obvious for the gain controlling means controlling gains of Gr and Gb channels of the variable-gain amplifying means so that the amplitude difference between the luminance signal for the horizontal line of R, G, R, G... color filters produced from the R and Gr signal and the

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luminance signal for the horizontal line of G, B, G, B and B color filters produced from the B and Gb signal is substantially reduced.

(If the luminance gains of the R and B channels are equal in level, the difference between the luminance signal from the R, G line and The R, B line will be zero. The difference can't be any less than zero. Therefore, the difference in the signals would be substantially reduced.)

Yamada does teach changing exposure to correct the green colors (**Column 5, Lines 45-50**), but does not teach changing gain to correct the green colors as claimed. Yamada and Taura lack motivation to combine the apparatuses. Yamada teaches only changing correction by controlling exposure.

However, correction can be made by controlling either gain or exposure (Van Rooy; **Column 3, Lines 20-25**).

Therefore, taking the combined teaching of Taura, Yamada, and Van Rooy as a whole, would have been obvious to one of ordinary skill in the art at the time of the invention to use obvious variation of Yamada as taught by Van Rooy in the apparatus of Taura to effectively eliminate lateral striped noise as suggested by Yamada (**Column 3, Lines 5-10 and 58-62**).

For claim 2, Taura, Yamada, and Van Rooy teach all the previous limitations and Yamada also that the gains of the channels for the Gr and Gb signals can be controlled by pre-calculated fixed compensation factors (**Yamada: Column 9, Lines 30-54**). The compensation factors are fixed for at least the time the correction is made (**Column 9, Lines 35-40**).

For claim 3, Taura, Yamada, and Van Rooy teach all the previous limitations. In the rejection of claim 1, it is noted that Yamada teaches the separation of the green signal in to

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separate Gb and Gr signals in order to use to the notoriously well-known Bayer filtering arrangement. The amplitude difference accounts for the lateral striped noise in the Yamada reference. Yamada then teaches the correction of this through the use of changing the integration time, which is analogous to changing variable gain as taught by Van Rooy (**Column 3, Lines 20-25**).

For claim 4, Taura, Yamada, and Van Rooy teach all the previous limitations and also that the image sensor is a CCD (**Taura; Figure 3**).

Claims 6-9 are method claims for claims 1-4. They are rejected under the same grounds of rejection.

8. Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taura (US 6,642,957) in view of Yamada (US 6,573,935) in further view of Van Rooy (US. 6,657,659) in further view of Kim (US. 6,597,395).

For claim 5, Taura, Yamada, and Van Rooy teach all the previous limitations, but lack teaching sampling and holding and automatic gain control before A/D Conversion.

Nevertheless, Kim teaches sampling and holding, automatic gain control, and then A/D conversion in that order (**Figure 1**). It would have been obvious at the time of the invention to combine the known sequence of operation of Kim with the system of Yamada, Tamayama, and Van Rooy in order to accurately calibrate for black level adjustment (**Abstract; Kim**).

Claim 10 is a method claim for claim 5. It is rejected under the same grounds of rejection.

Conclusion

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9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L Solomon whose telephone number is (703)-305-4370. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (703)-305-4946. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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GLS



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